



DPW

Please add a plus sign (+) inside this box → ☐

PTO/SB/21 (08-00)

Approved for use through 10/31/2002. OMB 0651-0031

U.S. Patent and Trademark Office: U.S. DEPARTMENT OF COMMERCE

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

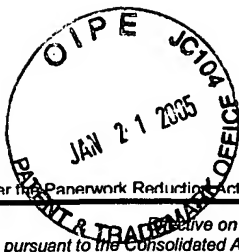
| | | | |
|---|-----------------------------|-------------------------------|-------|
| TRANSMITTAL FORM (to be used for all correspondence after initial filing) | Application Number | 10/715,319 | |
| | Filing Date | Nov. 17, 2003 | |
| | First Named Inventor | Fred D. LANG | |
| | Group Art Unit | 2857 | |
| | Examiner Name | Manuel L. BARBEE | |
| Total Number of Pages in This Submission | 8 + 456 | Attorney Docket Number | 11700 |

| ENCLOSURES (check all that apply) | | | | |
|--|---|--|---------|---|
| <input checked="" type="checkbox"/> Fee Transmittal Form <input checked="" type="checkbox"/> Fee Attached <input type="checkbox"/> Amendment / Reply <input type="checkbox"/> After Final <input type="checkbox"/> Affidavits/declaration(s) <input type="checkbox"/> Extension of Time Request <input type="checkbox"/> Express Abandonment Request <input checked="" type="checkbox"/> Information Disclosure Statement 3 SB08, 16 tech. articles, Pg 3+456 <input type="checkbox"/> Certified Copy of Priority Document(s) <input type="checkbox"/> Response to Missing Parts/ Incomplete Application <input type="checkbox"/> Response to Missing Parts under 37 CFR 1.52 or 1.53 | <input type="checkbox"/> Assignment Papers (for a Patent) <input type="checkbox"/> Drawing(s) <input type="checkbox"/> Licensing-related Papers <input type="checkbox"/> Petition <input type="checkbox"/> Petition to Convert to a Provisional Application <input type="checkbox"/> Power of Attorney, Revocation Change of Correspondence Address <input type="checkbox"/> Terminal Disclaimer <input type="checkbox"/> Request for Refund <input type="checkbox"/> CD, Number of CD(s) _____ | <input type="checkbox"/> After Allowance Communication to Group <input type="checkbox"/> Appeal Communication to Board of Appeals and Interferences <input type="checkbox"/> Appeal Communication to Group (Appeal Notice, Brief, Reply Brief) <input type="checkbox"/> Proprietary Information <input type="checkbox"/> Status Letter <input checked="" type="checkbox"/> Other Enclosure(s) (please identify below): Letter, Pages 2. Cert. of Mailing & Post Card. | | |
| <table border="1"><tr><td>Remarks</td><td>Note: PTO forms plus letter are 8 pages. 16 technical articles consist of approximately 456 pages. Please expedite this transmittal to the examiner.</td></tr></table> | | | Remarks | Note: PTO forms plus letter are 8 pages. 16 technical articles consist of approximately 456 pages. Please expedite this transmittal to the examiner. |
| Remarks | Note: PTO forms plus letter are 8 pages. 16 technical articles consist of approximately 456 pages. Please expedite this transmittal to the examiner. | | | |

| SIGNATURE OF APPLICANT, ATTORNEY, OR AGENT | |
|--|-------------------------------|
| Firm or Individual name | FRED D LANG, pro se Applicant |
| Signature | |
| Date | JANUARY 14, 2005 |

| CERTIFICATE OF TRANSMISSION | | | |
|--|-------------|------|-----------|
| I hereby certify that this correspondence is being deposited with FedX addressed to: Patent & Trademark Office, 220 20th Street South, Customer Window, Mail Stop Amendment, Crystal Plaza Two, Lobby, Rm 1B03, Arlington, VA, 22202 1/14/2005 | | | |
| Typed or printed name | FRED D LANG | | |
| Signature | | Date | 1/14/2005 |

Burden Hour Statement: This form is estimated to take 0.2 hours to complete. Time will vary depending upon the needs of the individual case. Any comments on the amount of time you are required to complete this form should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, Washington, DC 20231. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Assistant Commissioner for Patents, Washington, DC 20231.



PTO/SB/17 (12-04v2)

Approved for use through 07/31/2006. OMB 0651-0032

U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

Effective on 12/08/2004.
Fees pursuant to the Consolidated Appropriations Act, 2005 (H.R. 4818).**FEE TRANSMITTAL**
For FY 2005☒ Applicant claims small entity status. See 37 CFR 1.27**TOTAL AMOUNT OF PAYMENT** (\$) 180.00**Complete if Known**

| | |
|----------------------|------------------|
| Application Number | 10/715,319 |
| Filing Date | Nov. 17, 2003 |
| First Named Inventor | Fred D. LANG |
| Examiner Name | Manuel L. BARBEE |
| Art Unit | 2857 |
| Attorney Docket No. | 11700 |

METHOD OF PAYMENT (check all that apply)☒ Check ☐ Credit Card ☐ Money Order ☐ None ☐ Other (please identify): _____☐ Deposit Account Deposit Account Number: _____ Deposit Account Name: _____

For the above-identified deposit account, the Director is hereby authorized to: (check all that apply)

☐ Charge fee(s) indicated below☐ Charge fee(s) indicated below, except for the filing fee☐ Charge any additional fee(s) or underpayments of fee(s)
under 37 CFR 1.16 and 1.17☐ Credit any overpayments**WARNING:** Information on this form may become public. Credit card information should not be included on this form. Provide credit card information and authorization on PTO-2038.**FEE CALCULATION****1. BASIC FILING, SEARCH, AND EXAMINATION FEES**

| Application Type | FILING FEES | | SEARCH FEES | | EXAMINATION FEES | | Fees Paid (\$) |
|------------------|-------------|-----------------------|-------------|-----------------------|------------------|-----------------------|----------------|
| | Fee (\$) | Small Entity Fee (\$) | Fee (\$) | Small Entity Fee (\$) | Fee (\$) | Small Entity Fee (\$) | |
| Utility | 300 | 150 | 500 | 250 | 200 | 100 | |
| Design | 200 | 100 | 100 | 50 | 130 | 65 | |
| Plant | 200 | 100 | 300 | 150 | 160 | 80 | |
| Reissue | 300 | 150 | 500 | 250 | 600 | 300 | |
| Provisional | 200 | 100 | 0 | 0 | 0 | 0 | |

2. EXCESS CLAIM FEES**Fee Description**

Each claim over 20 (including Reissues)

| Fee (\$) | Small Entity Fee (\$) |
|----------|-----------------------|
| 50 | 25 |

Each independent claim over 3 (including Reissues)

| | |
|-----|-----|
| 200 | 100 |
|-----|-----|

Multiple dependent claims

| | |
|-----|-----|
| 360 | 180 |
|-----|-----|

| Total Claims | Extra Claims | Fee (\$) | Fee Paid (\$) |
|--------------|--------------|----------|---------------|
|--------------|--------------|----------|---------------|

- 20 or HP = _____ x _____ = _____

HP = highest number of total claims paid for, if greater than 20.

| Indep. Claims | Extra Claims | Fee (\$) | Fee Paid (\$) |
|---------------|--------------|----------|---------------|
|---------------|--------------|----------|---------------|

- 3 or HP = _____ x _____ = _____

HP = highest number of independent claims paid for, if greater than 3.

Multiple Dependent Claims

| Fee (\$) | Fee Paid (\$) |
|----------|---------------|
|----------|---------------|

3. APPLICATION SIZE FEE

If the specification and drawings exceed 100 sheets of paper (excluding electronically filed sequence or computer listings under 37 CFR 1.52(e)), the application size fee due is \$250 (\$125 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).

| Total Sheets | Extra Sheets | Number of each additional 50 or fraction thereof | Fee (\$) | Fee Paid (\$) |
|--------------|--------------|--|----------|---------------|
|--------------|--------------|--|----------|---------------|

- 100 = _____ / 50 = _____ (round up to a whole number) x _____ = _____

4. OTHER FEE(S)

Non-English Specification, \$130 fee (no small entity discount)

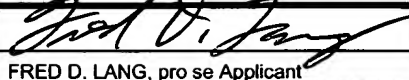
Fees Paid (\$)

Other (e.g., late filing surcharge): _____

Submission of IDS (Fee Code 1806)

\$180.00

SUBMITTED BY

| | | | |
|-------------------|---|--------------------------------------|------------------------|
| Signature |  | Registration No. (Attorney/Agent) | Telephone 415-455-0100 |
| Name (Print/Type) | FRED D. LANG, pro se Applicant | | Date Jan. 14, 2005 |

This collection of information is required by 37 CFR 1.136. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 30 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.



IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

| | | | |
|-------------|---------------------------------|---|--------------------|
| In regards | Application of Fred D. Lang |) | GAU: 2857 |
| Serial No. | 10/715,319 |) | Examiner: |
| Filing Date | November 17, 2003 |) | Manuel L. Barbee |
| Title: | METHOD FOR DETECTING HEAT |) | |
| | EXCHANGER TUBE FAILURES AND |) | |
| | THEIR LOCATION WHEN USING |) | |
| | INPUT/LOSS PERFORMANCE |) | Date of Submittal: |
| | MONITORING OF A RECOVERY BOILER |) | January 14, 2005 |

U.S. Patent and Trademark Office
 220 20th Street South
 Customer Window, Mail Stop Amendment
 Crystal Plaza Two, Lobby, Room 1B03
 Arlington, VA 22202

INFORMATION DISCLOSURE STATEMENT

Sir:

Applicant herein submits eighteen (18) references that may be material to the examination of this application. These references are cited on three PTO/SB08 forms, attached. In addition, copies of sixteen of these documents are herein enclosed for the convenience of the Examiner. The two references not enclosed are the American Society of Mechanical Engineer's "Performance Test Codes" 4.1 and 4, which are considered common place at any technical library.

All references are in English, including the German standard.

The applicant asks that the Examiner consider these references, and make them of record in the prosecution history.

Should you have any questions please call me at any time at 415-455-0100.

Sincerely,

A handwritten signature in black ink, appearing to read "Fred D. Lang", with a long, sweeping horizontal stroke extending to the right.

Fred D. Lang,

pro se Applicant, and Inventor
of Application 10/715,319.

USPTO Customer No. **40088**.

12 San Marino Drive

San Rafael, CA 94901

Phone: (415) 455-0100

FAX: (415) 455-0215

E-mail: Lang@ExergeticSystems.com



(Use as many sheets as necessary)

| | | | |
|-------|---|----|---|
| Sheet | 1 | of | 3 |
|-------|---|----|---|

| | |
|------------------------|------------------|
| Application Number | 10/715,319 |
| Filing Date | Nov. 17, 2003 |
| First Named Inventor | Fred D. LANG |
| Art Unit | 2857 |
| Examiner Name | Manuel L. BARBEE |
| Attorney Docket Number | 11700 |

[illegible]

| FOREIGN PATENT DOCUMENTS | | | | | | |
|--------------------------|-----------------------|---|--------------------------------|---|---|----------------|
| Examiner Initials* | Cite No. ¹ | Foreign Patent Document | Publication Date MM-DD-YYYY | Name of Patentee or Applicant of Cited Document | Pages, Columns, Lines, Where Relevant Passages Or Relevant Figures Appear | T ⁶ |
| | | Country Code ³ Number ⁴ Kind Code ⁵ (if known) | | | | |
| | | Australia, 762836 | 10/23/2003 | Fred D. Lang | Both resultant | |
| | | Canada, 2325929 | 6/08/2004 | Fred D. Lang | from PCT filing | |
| | | | | | of 09/273711 | |
| | | | | | (becoming | |
| | | | | | US-6522994). | |
| | | | | | | |

Date
Considered

*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant. ¹ Applicant's unique citation designation number (optional). ² See Kinds Codes of USPTO Patent Documents at www.uspto.gov or MPEP 901.04. ³ Enter Office that issued the document, by the two-letter code (WIPO Standard ST.3). ⁴ For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. ⁵ Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. ⁶ Applicant is to place a check mark here if English language Translation is attached.

This collection of information is required by 37 CFR 1.97 and 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 2 hours to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

If you need assistance in completing the form, call 1-800-PTO-9199 (1-800-786-9199) and select option 2.

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

| | | | | | |
|---|---|--------------------------|------------------|------------------------|-------|
| Substitute for form 1449/PTO INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Use as many sheets as necessary) | | Complete if Known | | | |
| | | Application Number | 10/715,319 | | |
| | | Filing Date | Nov. 17, 2003 | | |
| | | First Named Inventor | Fred D. LANG | | |
| | | Art Unit | 2857 | | |
| | | Examiner Name | Manuel L. BARBEE | | |
| Sheet | 2 | of | 3 | Attorney Docket Number | 11700 |

| NON PATENT LITERATURE DOCUMENTS | | | |
|---------------------------------|-----------------------|--|----------------|
| Examiner Initials* | Cite No. ¹ | Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published. | T ² |
| | | Chapter 18, "Failure Analysis and In-Service Experience - Fossil Boilers and Other Heat Transfer Surfaces" of The ASME Handbook on Water Technology for Thermal Power Systems, P. Cohen, Editor, The American Society of Mechanical Engineers, New York, NY, 1989 | |
| | | J. Gommi, "Root Causes of Recovery Boiler Leaks", 1997 Engineering and Papermakers Conference, TAPPI Proceedings, available from TAPPI Press as product code ENG97509, Atlanta, Georgia. | |
| | | D.G. Bauer and W.B.A. Sharp, "The Inspection of Recovery Boilers to Detect Factors That Cause Critical Leaks", TAPPI Journal, September 1991, TAPPI Press, Atlanta, Georgia. | |
| | | "Performance Test Procedure Sodium Based Recovery Units", CA Report No. 84041601, March 1996, TAPPI Press, Atlanta Georgia. | |
| | | "Steam, Its Generation and Use", 40th Edition, Edited by S.C. Stultz and J.B. Kitto, published 1992 by The Babcock & Wilcox Company, Barberton, Ohio (see Chapter 26, page 26-5) | |
| | | American Society of Mechanical Engineers' (ASME) Performance Test Code (PTC) 4.1. | |
| | | American Society of Mechanical Engineers' (ASME) Performance Test Code (PTC) 4. | |
| | | A.B. Gill, Power Plant Performance, Butterworths: London, 1984; Chapter 2, pages 70-77. | |
| | | German standard, "Acceptance Testing of Steam Generators, DIN 1942, DIN DEUTSCHES Institut Fur Normung E.V., February 1994. | |
| | | European standard (draft) prEN 12952-15:1999 (also cited as: CEN/TC 269/WG 3 N 337), "Water-Tube Boilers and Auxiliary Installations - Part 15: Acceptance Tests", November 1999, European Committee for Standardization, Central Secretariat, rue de Stassart, 36, Brussels | |

| | | | |
|--------------------|--|-----------------|--|
| Examiner Signature | | Date Considered | |
|--------------------|--|-----------------|--|

*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

¹ Applicant's unique citation designation number (optional). ² Applicant is to place a check mark here if English language Translation is attached. This collection of information is required by 37 CFR 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 2 hours to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

If you need assistance in completing the form, call 1-800-PTO-9199 (1-800-786-9199) and select option 2.

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

| | | | |
|---|------------------------|--------------------------|------------------|
| INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Use as many sheets as necessary) | | Complete if Known | |
| | | Application Number | 10/715,319 |
| | | Filing Date | Nov. 17, 2003 |
| | | First Named Inventor | Fred D. LANG |
| | | Art Unit | 2857 |
| | | Examiner Name | Manuel L. BARBEE |
| Sheet 3 of 3 | Attorney Docket Number | 11700 | |

| NON PATENT LITERATURE DOCUMENTS | | | |
|---------------------------------|-----------------------|---|----------------|
| Examiner Initials* | Cite No. ¹ | Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published. | T ² |
| | | British Standard "Code for Acceptance Tests on Stationary Steam Generators of the Power Station Type", BS 2885:1974, ISBN: 0 580 08136 2 | |
| | | D.F. Shanno and K.H. Phua, "Algorithm 500, Minimization of Unconstrained Multivariate Functions", ACM Transactions on Mathematical Software, Vol.2, No.1, March 1976, pages 87-94. | |
| | | D.F. Shanno and K.H. Phua, "Remark on Algorithm 500, Minimization of Unconstrained Multivariate Functions", ACM Transactions on Mathematical Software, Vol.6, No.2, December 1980, pages 618-622. | |
| | | W.L. Goffe, G.D. Ferrier and J. Rogers, "Global Optimization of Statistical Functions with Simulated Annealing", Journal of Econometrics, Vol.60, No.1/2, pp.65-100, Jan./Feb. 1994. | |
| | | A. Corana, M. Marchesi, C. Martin and S. Ridella, "Minimizing Multimodal Functions of Continuous Variables with the 'Simulated Annealing' Algorithm", ACM Transactions on Mathematical Software, Vol.13, No.3, pp.262-280, Sept. 1987. | |
| | | F. James, "A Review of Pseudorandom Number Generators", Computer Physics Communications, Vol.60, pp.329-344, 1990. | |
| | | W.H. Press, S.A. Teukolsky, W.T. Vetterling & B.P. Flannery, Numerical Recipes in FORTRAN 77, The Art of Scientific Computing, Cambridge University Press, Cambridge and New York (1992), Chapter 9.6 on Newton-Raphson Method for Nonlinear Systems of Equations, and Chapter 9.7 on Globally Convergent Methods for Nonlinear Systems of Equations. | |
| | | FD Lang, "Fuel Consumption Index for Proper Monitoring of Power Plants - Revisited", Am. Society of Mech. Engrs., 2002 International Joint Power Generation Conference, Scottsdale, AZ, IJPGC2002-26097. | |
| | | | |
| | | | |

| | | | |
|--------------------|--|-----------------|--|
| Examiner Signature | | Date Considered | |
|--------------------|--|-----------------|--|

*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

¹ Applicant's unique citation designation number (optional). ² Applicant is to place a check mark here if English language Translation is attached. This collection of information is required by 37 CFR 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 2 hours to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

If you need assistance in completing the form, call 1-800-PTO-9199 (1-800-786-9199) and select option 2.

CERTIFICATION OF MAILING UNDER 37 C.F.R. §1.8

I hereby certify that this correspondence and the documents, papers and/or fees referred to as attached therein are being deposited with Federal Express service on **January 14, 2005**, under 37 CFR 1.8, FedEx tracking number **8426-1298-8516** addressed to the:

U.S. Patent and Trademark Office
220 20th Street South
Customer Window, Mail Stop Amendment
Crystal Plaza Two, Lobby, Room 1B03
Arlington, VA 22202



FRED D. LANG, Applicant

Name of Person This Mailing

Signature of Person This Mailing

Docket No.: 11700
Application No.: 10/715,319
Inventor & Appl.: Fred D. Lang
Title: METHOD FOR DETECTING HEAT EXCHANGER TUBE
FAILURES AND THEIR LOCATION WHEN USING INPUT/LOSS
PERFORMANCE MONITORING OF A RECOVERY BOILER

Total = 8 pages of forms & letter + 456 pages of reference material:

- ___ Transmittal Form, Pages 1
- ___ Fee Transmittal with Fee of \$180 by check #5791; Pages 1
- ___ Letter; Pages 2.
- ___ Information Disclosure Statements by Applicant, PTO/SB/08; Pages 3.
- ___ this Certificate of Mailing w/Postcard for return receipt; Pages 1.
- ___ Sixteen (16) references; Pages 456 (approximately).